200532

INTERIM

SUPPLEMENTAL SITE CHARACTERIZATION / CLEANUP REPORT

at the

WELLS & WADE FRUIT COMPANY
Birchmount facility
Wenatchee, Washington

July 1994

by

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ERM
EnviroClean

BIRCHMOUNT ORCHARDS FACILITY

Wenatchee, Washington

INTERIM

SUPPLEMENTAL SITE CHARACTERIZATION/ CLEANUP REPORT

Prepared for

Wells and Wade Fruit Company

Prepared by

ERM-EnviroClean Northwest, Inc.

July 1994

CONTENTS

EXECUTIVE SUMMARY

This report summarizes the current independent site characterization and remedial activities performed by ERM-EnviroClean-NW (EC-NW) at the Birchmount Orchard facility in Wenatchee, Washington. Additional remedial action reports will be submitted when completed.

This Supplemental Site Characterization study was designed to:

- Further evaluate the extent and magnitude of petroleum-impacted soil and groundwater identified in previous studies by completing: (1) two soil borings and (2) five groundwater monitoring wells at the site.

- Evaluate hydrogeologic conditions at the site.

The results of the study indicate:

- Petroleum concentrations greater than the MTCA Method A levels in soil and groundwater at the site are within a limited area extending less than 100 feet southeast of the former location of the UST system. The only petroleum constituent with sample concentrations greater than the MTCA Method A cleanup levels is gasoline-range hydrocarbons (TPH-G).

- Groundwater flow from the former UST system area appears to be in a southwesterly direction.

- ERM-EC recommends a remedial pilot test be conducted. The results of this test will be used to evaluate available remedial options for the groundwater at the site.

1.0 *PROJECT BACKGROUND/SITE DESCRIPTION*

On 22 November 1993, an Interim Status Report, concerning three underground storage tanks (USTs) and corresponding site assessment and interim remedial activities, was submitted to the Washington State Department of Ecology (WDOE) Central Region Toxics Cleanup Program in Yakima [Sage Earth Sciences, Inc. (Sage), 1993]. WDOE reviewed the report and determined that the tanks were "farm exempt" from WDOE UST regulations and that reporting was not required (*Appendix A - Ecology "Farm Exempt" Letter*).

The removed USTs include one diesel tank and two gasoline tanks. The capacity of each of these tanks was 550 gallons; the age of the tanks is unknown. During removal, the USTs were observed to be corroded with holes and pitted surfaces.

For clarity and ease of agency review, this report is in general accordance with the WDOE Draft Remedial Action Plan Report format (March 1994).

Following removal of the three former USTs at the site, petroleum-affected soil was excavated and replaced by clean backfill. Samples from the excavation indicated that petroleum hydrocarbon concentrations above MTCA-Method A cleanup levels remained in soils at the bottom of the excavation. Two soil borings were drilled by Sage in 1993 to determine the vertical extent of petroleum-impacted soil beneath the excavation. These data confirmed that gasoline-range hydrocarbons had impacted the soil beneath the site.

Since February 1994, EC-NW has provided additional characterization and cleanup services at the site. Additional borings and monitoring wells were installed and data were evaluated.

1.01 *LOCATION*

A. Site Name

The Birchmount Orchard facility is owned by Wells & Wade Fruit Co.

B. Street Address and Location

The Birchmount Orchard facility is at 3717 Crestview, Wenatchee, Washington. The mailing address of the current business operation at the site is: Wells & Wade Fruit Co., P.O. Box 259, Wenatchee, Washington 98807.

The site is approximately one mile north of U.S. Highway 92 on Crest-view Road *(Figure 1, Site Vicinity Map)*. The facility's boundaries are Crestview Road on the west, orchard areas owned by Wells & Wade to the north and east, and American Fruit Company Road to the south.

Structures at the site include an office building, maintenance shop, and equipment storage buildings. *Figure 2 , Site Plan Map* shows site features, including underground electrical lines, the location of former USTs, and the new (replacement) UST system.

C. Phone Number

The telephone number for the facility is (509) 886-0440.

D. Map of Site Location

See *Figure 1 , Site Vicinity Map.*

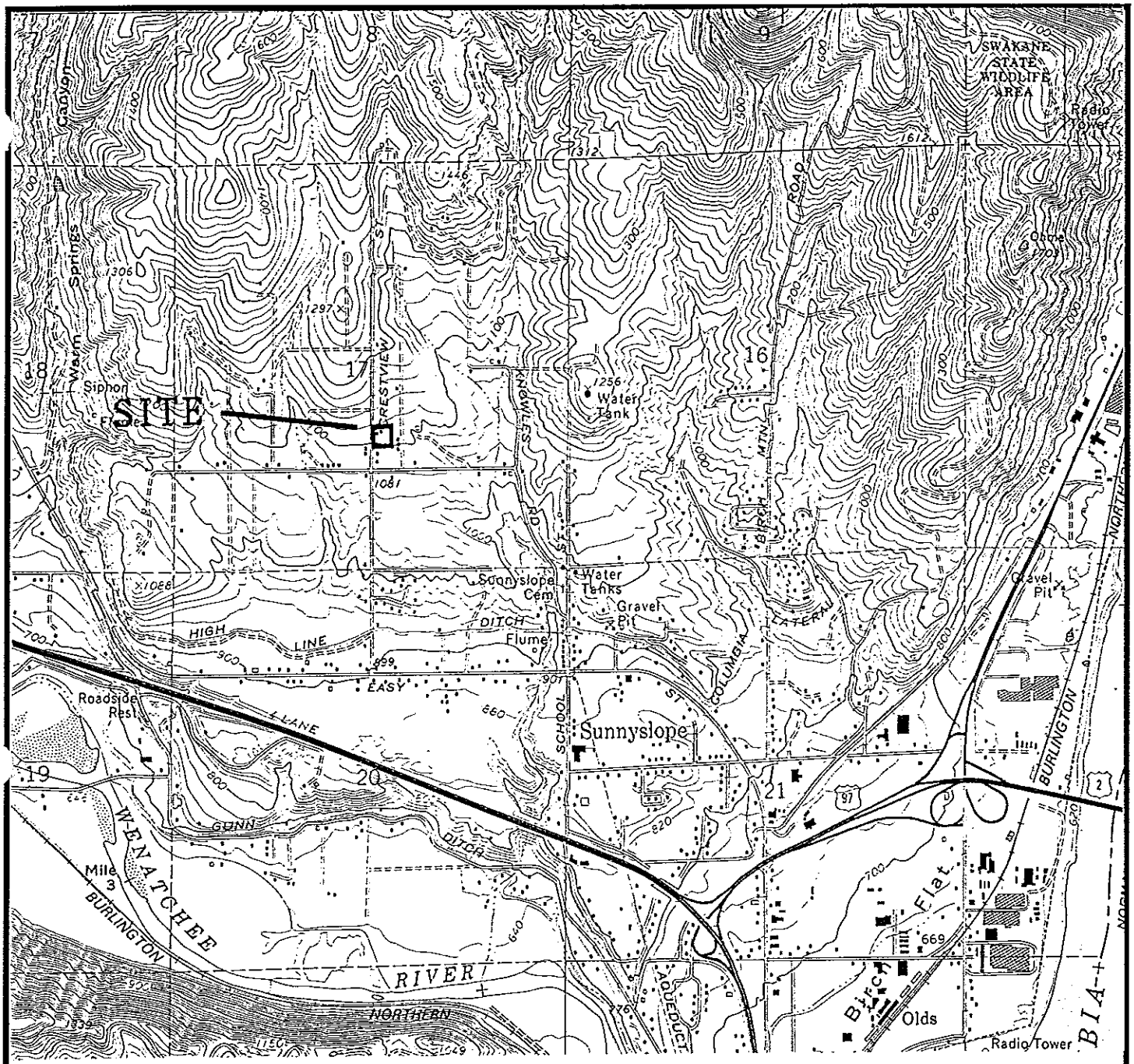
E. Site History and Land Use

The site has been owned by Wells & Wade Fruit Company since its initial development. Site activities that may have contributed to petroleum impacts to soil and groundwater at the site are limited to the former USTs removed from the vicinity of boring B-4 (*Figure 2*). Adjacent land use consists of orchards and scattered residences.

Wells & Wade Fruit Company operates an agricultural orchard at the site where fruit trees are planted, grown and harvested. As a part of this operation, USTs are used to store fuel for agricultural equipment. The current UST is a vaulted system at the location shown on *Figure 2*.

1.0.2 TOPOGRAPHY AND GEOLOGY

Topography slopes moderately to the south within the facility area . Intermittent drainage in this semi-arid region is along shallow ditches and gullies. When present, surface water drainage flows toward the High Line Canal, approximately 0.7 miles south of the site. The Wenatchee River is approximately 1.5 miles south and the Columbia River is approximately 2 miles east of the site. Up to 50 feet of unconsolidated silt, sand, and gravel deposits overlie bedrock in the site vicinity. Bedrock in the site vicinity consists of arkosic sandstone and siltstone.



WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY; Wenatchee, Washington

Supplemental Site Characterization Project

By: ERM-Enviroclean Northwest, Inc. June, 1994

Figure 1. Site Vicinity Map.

Base: USGS Wenatchee 7.5' Topographic Quadrangle, 1966 (Photorevised 1987)

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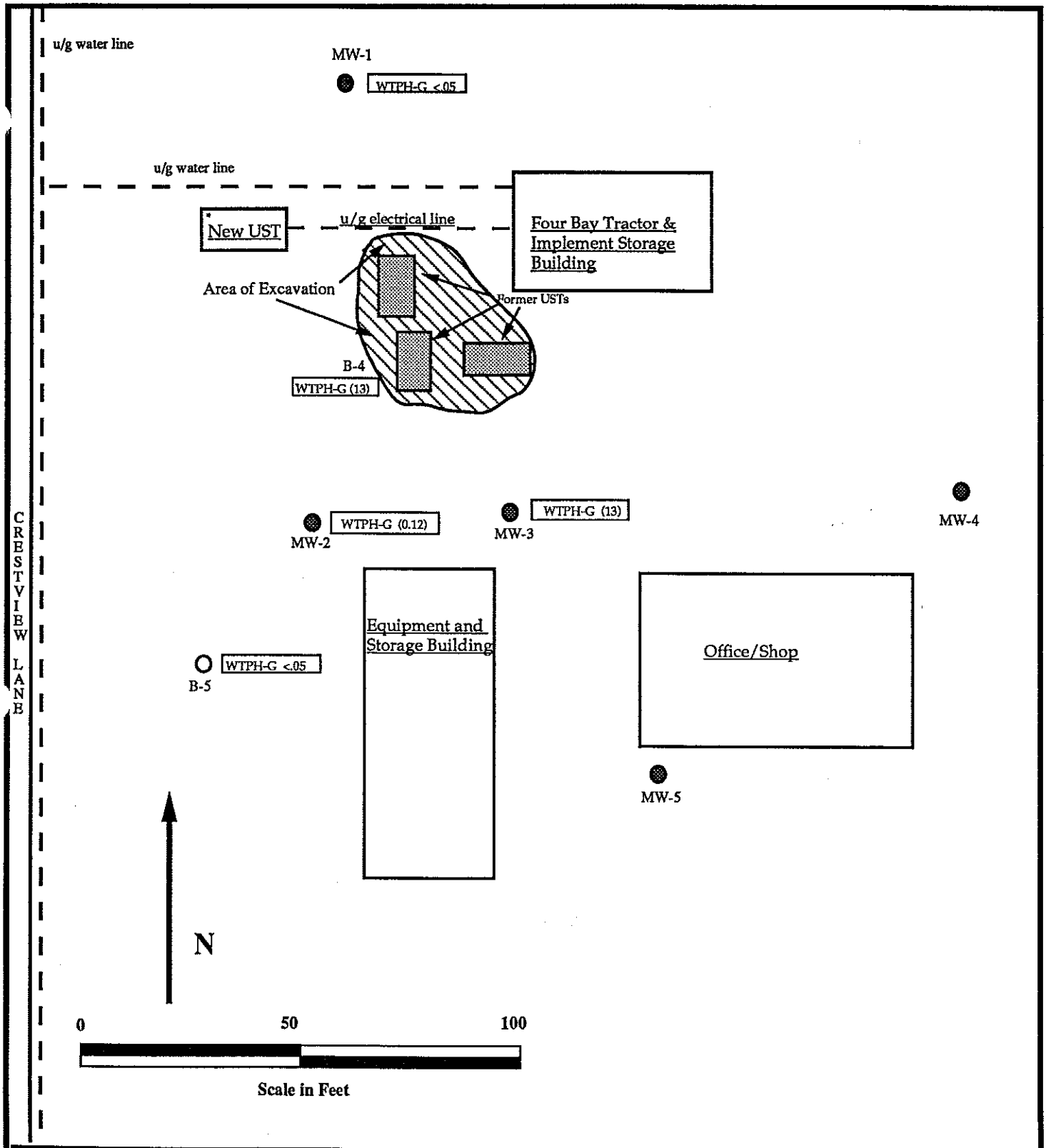


WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY: Wenatchee, Washington

Supplemental Site Characterization Project

By: ERM-Enviroclean Northwest, Inc. June, 1994

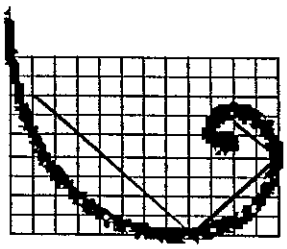
Figure 2. Site Plan Map.

○ = Soil Boring

⊗ = Monitoring Well

WTPH-G (5) = Groundwater concentrations of gasoline-range hydrocarbons, in milligrams per liter

Note: All locations shown are approximate.



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A. Site Diagram

See *Figure 2, Site Plan Map.*

B. Site Soil Types

Descriptions and classifications of soils encountered during drilling at the site are included in the boring logs (*Appendix B*). The general stratigraphy of the site area and soil types observed during drilling activities are summarized as follows per the Unified Soil Classification System (USCS):

- 0-4 feet - medium dense, brown silt and some fine sand (ML).
- 4-8 feet - medium dense, light gray silt and fine to coarse-grained sand (ML to SP).
- 7-9.5 feet - medium dense, light brown fine to coarse sand and some silt (SM).
- 9.5-25 feet - very dense, light brown fine to coarse sand with varying amounts of fine gravel (SP).
- 25-32 feet - very dense, light brown fine to medium sand and trace silt (SP).
- 32-55 feet - very hard, light to reddish brown silt, none to some fine sand, some interbedded lenses of fine sand and weathered bedrock (ML).

1.1 *RELEASE INFORMATION/SITE CHARACTERIZATION*

Two gasoline USTs and one diesel UST were removed from the site in December 1992 by Sage, discussed below.

1.2 *PREVIOUS INVESTIGATIONS*

In the course of removing USTs, Sage discovered soil suspected to have been impacted by a petroleum release (Sage November, 1993). Sage sampled the soil and the laboratory results confirmed the presence of hydrocarbon-impacted soil.

Sage excavated in the vicinity of the former USTs to a depth of approximately 25 feet and temporarily stockpiled approximately 590 cubic yards of petroleum-impacted soil. No groundwater was

encountered in the excavation. Two soil samples collected from the bottom of the excavation contained concentrations of gasoline-range hydrocarbons greater than the MTCA Method A soil cleanup level. Sage backfilled the excavation with clean soil because the available equipment could not excavate deeper, the remaining impacted soil volume appeared to be localized and minor, and the excavation was too deep to safely leave open.

To characterize the vertical extent and nature of the remaining impacted soil, Sage subsequently collected soil samples from borings drilled into and beneath the backfilled soil in the excavation. However, one of these borings unexpectedly encountered water. Relevant information from these studies are included with the site characterization/sampling described in *Section 1.6*, below.

1.3 *SELECTION OF CLEANUP STANDARDS*

Washington State Model Toxics Control Act Method A soil and groundwater cleanup standards are currently targeted as the cleanup levels under this remedial action.

1.4 *EXPLANATION OF REMEDIAL ACTIONS TAKEN AND RATIONALE FOR SELECTING THE REMEDIAL ACTION*

Sage's contractor removed as much of the petroleum-impacted soil from the UST cavity as possible with the on-site excavation equipment, and then backfilled the excavation with imported fill. The hydrocarbon-impacted soil removed from the excavation is currently being treated on-site in three bioremediation pad areas.

1.5 *INSTITUTIONAL CONTROLS*

Institutional controls, if needed, will be described in the *Final Independent Remedial Action Report*.

1.6 *SAMPLING AND ANALYSIS*

To assess the extent of hydrocarbon-impacted soil and groundwater, five groundwater monitoring wells were installed and two additional soil borings were drilled to depths ranging from 35 to 55 feet at the locations shown on *Figure 2*.

A. *Field Screening Techniques*

Samples collected during drilling were field screened for volatile organic compounds (VOCs) using a photoionization detector (PID). The rationale for using this technique was to: (1) identify areas with elevated concentration of these types of constituents, and (2) to select representative samples for follow-up chemical analysis.

B. *Standard Operating Procedures*

Hollow-stem Auger Drilling and Soil Sampling

The soil borings were drilled using a hollow-stem auger drill rig. This method of drilling consisted of screwing augers with a hollow stem into the ground using a truck-mounted drill rig. Cuttings were brought to the surface by the rotating action of the auger. Soil samples were obtained by driving a modified Dames & Moore split-spoon sampler at specified depths.

The generalized scope of subsurface exploration completed at the site by ERM-EC is as follows:

- One upgradient and four cross- and down-gradient groundwater monitoring wells were installed near the UST excavation area to determine the groundwater and soil characteristics. These wells were designed to sample water at the water table and extended to depths of about 36 to 50 feet below the ground surface.

- One soil boring (B-4) was drilled to a depth of 40 feet through the UST backfill to compare petroleum impacts to soil and groundwater, if any, with earlier results.

- One soil boring (B-5) was drilled to a depth of 49 feet downgradient of the UST location to determine soil characteristics and obtain a grab sample of groundwater at the boring location.

- Soil samples were collected at 5-foot intervals from the monitoring wells and borings for field screening. Chemical analysis was performed on appropriately selected samples.

- Groundwater wells were developed, sampled and chemically analyzed according to WDOE-recommended guidelines.

C. *Laboratory Reports*

Laboratory data packages including sample results, QA/QC (quality assurance/quality control) information, and chain-of-custody records are provided in *Appendix C.*

D. *Sample Locations*

The locations of the monitoring wells and borings are shown in *Figure* 2.

E. *Sample Depths and Results*

Chemical analytical results for soil samples collected from the soil and monitoring well borings are summarized in *Table 1.* Chemical analytical results for groundwater samples collected from borings B-4 and B-5 and the monitoring wells are summarized in *Table* 2. Gasoline-range hydrocarbon results from the water samples are summarized on *Figure* 2.

F. *Sampling Rationale*

Soil samples from the soil and monitoring well borings were selected for chemical analysis based on elevated headspace vapor concentrations, location of the sample in relation to the groundwater table, and/or the location of the deepest soil sample in a boring.

G. *Soil Profiles*

Soil profiles and sample depths in each monitoring well and boring location are provided on the boring logs in *Appendix B.*

H. *Depth to Groundwater*

The depth to groundwater at each monitoring well was measured on May 12, 1994. Groundwater elevations are included in *Figure 3, Potentiometric Surface Map.*

I. *Residual concentrations above MTCA (Method A)*

Residual concentrations of petroleum hydrocarbons in some soil and groundwater at the site exceed MTCA Method A cleanup levels at soil boring B-4 and monitoring well MW-3. Chemical analytical results for soil and groundwater samples obtained from these locations are included in *Tables 1* and 2 .

TABLE 1
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
SOIL BORINGS AND MONITORING WELLS
BIRCHMOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

Sample Number	Date Sampled	Depth of Sample (feet)	Hydrocarbon Identification(2) (mg/kg)			Gasoline-range Hydrocarbons(3) (mg/kg)	BETX(4) (mg/kg)			
			Gasoline-range Hydrocarbons	Diesel-range Hydrocarbons	Heavy Oil-range Hydrocarbons		B	E	T	X
B1-S5 (MW-1)	3/2/94	20.5	<20	<50	<100	-	-	-	-	-
B2-S10 (MW-2)	3/2/94	40.5	<20	<50	<100	-	-	-	-	-
B3-S8 (MW-3)	3/3/94	40.5	Detected	<50	<100	7200	<0.050	8.2	<1.0	1
B3-S10 (MW-3)	3/3/94	50.5	<20	<50	<100	-	-	-	-	-
B4-S3	3/4/94	30.5	Detected	<50(5)	Detected(6)	280	<0.050	0.19	<0.050	0.51
B4-S5	3/4/94	40.5	Detected	<50	<100	770	<0.050	0.8	<0.050	2.2
B5-33	5/9/94	33	-	-	-	<2.5	<0.050	<0.050	<0.050	<0.10
B5-43	5/9/94	43	-	-	-	<2.5	-	-	-	-
B6-8 (MW-4)	5/9/94	8	-	-	-	<2.5	-	-	-	-
B6-33 (MW-4)	5/9/94	33	-	-	-	<2.5	<0.050	<0.050	<0.050	<0.10
B6-53 (MW-4)	5/9/94	53	-	-	-	<2.5	-	-	-	-
B7-33 (MW-5)	5/10/94	33	-	-	-	<2.5	<0.050	<0.050	<0.050	<0.10
B7-48 (MW-5)	5/10/94	48	-	-	-	<2.5	-	-	-	-
MTCA Method A soil cleanup level						100	0.5	20	40	20

Notes:

(1) Field screening methods are described in Section 1.6 of the report text

(2) By Ecology Method WTPH-HCID

(3) By Ecology Method WTPH-G

(4) By EPA Method 8020. B = benzene, E= ethylbenzene, T = toluene and X = total xylenes

(5) 71 mg/kg diesel-range hydrocarbons detected in sample B4-S3 by Ecology Method WTPH-D

(6) 76 mg/kg heavy oil-range hydrocarbons detected in sample B4-S3 by Ecology Method WTPH-418.1 Modified

Chemical analytical services provided by Pacific Northern Analytical, Inc. of Redmond, Washington

ppm = parts per million

mg/kg = milligrams per kilogram

- = not tested

TABLE 2
SUMMARY OF GROUND WATER CHEMICAL ANALYTICAL DATA
SOIL BORINGS AND MONITORING WELLS
BIRCHMOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

Well/Boring Number	Date Sampled	Gasoline-range Hydrocarbons(1) (mg/L)	BETX(2) (ug/L)				Diesel-range Hydrocarbons(3) (mg/L)
			B	E	T	X	
MW-1	3/4/94	<0.05	-	-	-	-	<0.15
MW-2	3/5/94	0.12	-	-	-	-	-
MW-3	3/5/94	13	<0.050	8.2	<1.0	1	-
B-4	3/4/94	13	-	-	-	-	0.63
B-5	5/9/94	<0.05	<0.050	0.19	<0.050	0.51	-
MTCA Method A cleanup level		1	5	30	40	20	1

Notes:

(1) By Ecology Method WTPH-G

(2) By EPA Method 8020. B = benzene, E= ethylbenzene, T = toluene and X = total xylenes

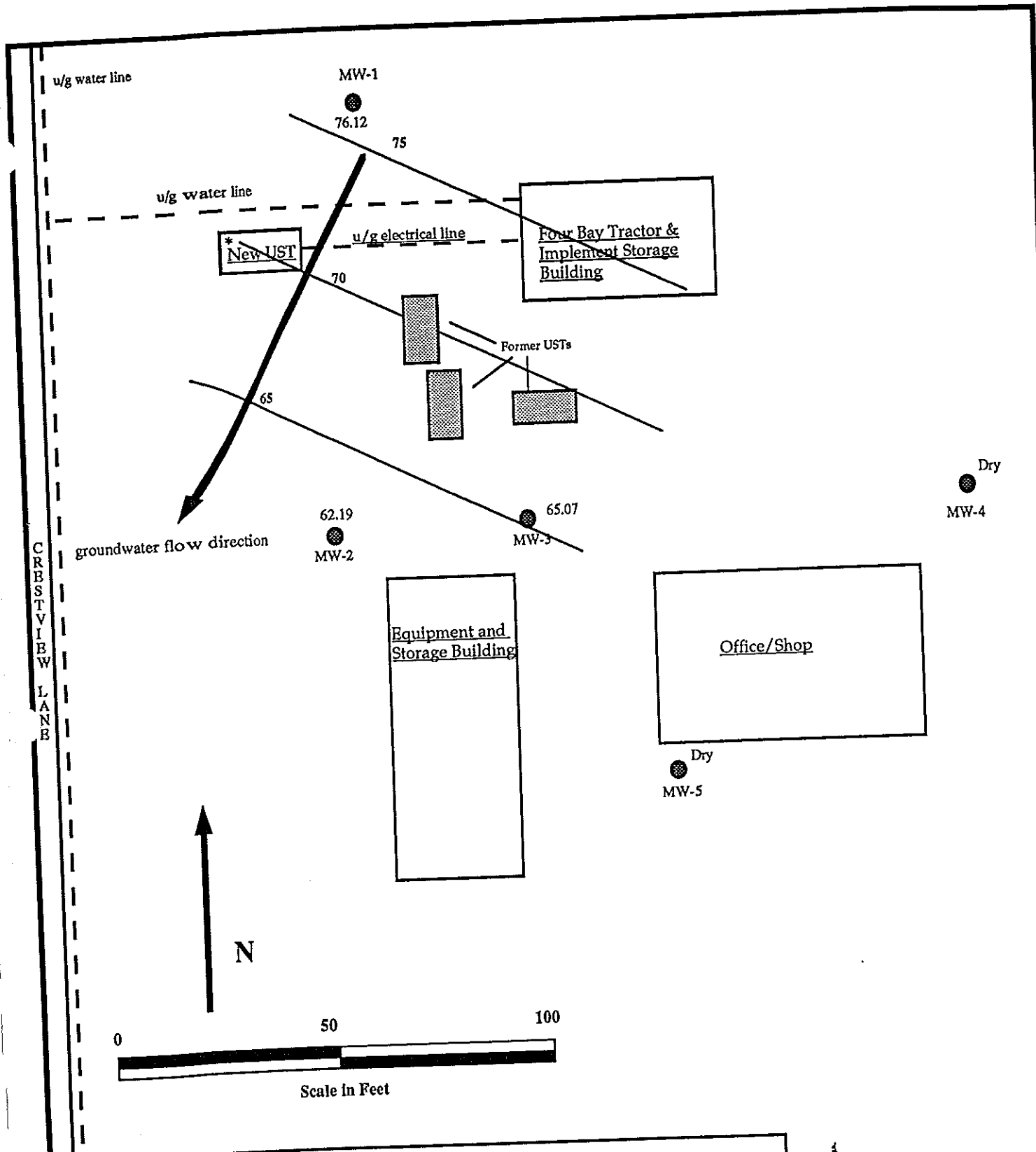
(3) By Ecology Method WTPH-D

Chemical analytical services provided by Pacific Northern Analytical, Inc. of Redmond, Washington

ug/L = micrograms per liter

mg/L = milligrams per liter

- = not tested



WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY; Wenatchee, Washington

Supplemental Site Characterization Project

By: ERM-Enviroclean Northwest, Inc. June, 1994

Figure 3. Potentiometric Surface Map.

76.12 = Monitoring Well (with groundwater elevation)

65 = Groundwater isoelevation contour

Notes: 1. Water level measurements obtained May 12, 1994.
2. Elevations shown are from a site-specific datum of 100.00 feet (shown by an *).
3. All locations shown are approximate.

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2.0 INTRODUCTION

Activity during the initial Environmental Assessment and this Supplemental Environmental Assessment were limited to groundwater and/or soil sampling in the following locations (*Figure* 2):

- One upgradient (MW-1) and four cross- and down-gradient groundwater monitoring wells.
- One soil boring drilled to a depth of 40 feet at the site of the UST excavation.
- One soil boring (B-5) to a depth of 49 feet downgradient of the UST location to determine soil characteristics and obtain a grab sample of groundwater at the boring location.

These initial and supplemental assessments were designed to determine the following:

- Lateral and vertical extent of the petroleum-affected soil.
- Magnitude of impacts to groundwater quality.
- Hydrogeologic characteristics of the impacted soil and groundwater.

Data gathered during the initial phase of work were used to determine whether further environmental restoration of site soil and groundwater would be necessary. These data will assist in the development and selection of remedial alternatives if remediation is necessary, and if so, specific remedial designs and cost estimates.

2.1 GROUNDWATER INVESTIGATION

A groundwater remediation pilot test is scheduled for June-July 1994 to assist in remedial alternative selection.

2.1.1 *Groundwater Impact Confirmed*

A. Potentiometric Surface Map

See *Figure* 3 - *Potentiometric Surface Map.*

B. Geologic Cross-Section

The locations of the soil borings and monitoring wells used to construct cross-sections and the locations of the cross-sections are shown in *Figure A-1* in *Appendix B* of this report. Geologic cross-sections A-A' and B-B' are included as *Figures A-2 and A-3*.

2.1.2 *Groundwater Treatment*

A pilot test will be completed in July 1994 to determine the feasibility of a remediation system for petroleum-impacted groundwater.

2.2 *REGULATORY RECORDS/PERMITS*

A. List of Permits

Monitoring well and soil boring start cards were obtained from the WDOE by the drilling subcontractors.

B. List of Federal or State Regulatory Activities

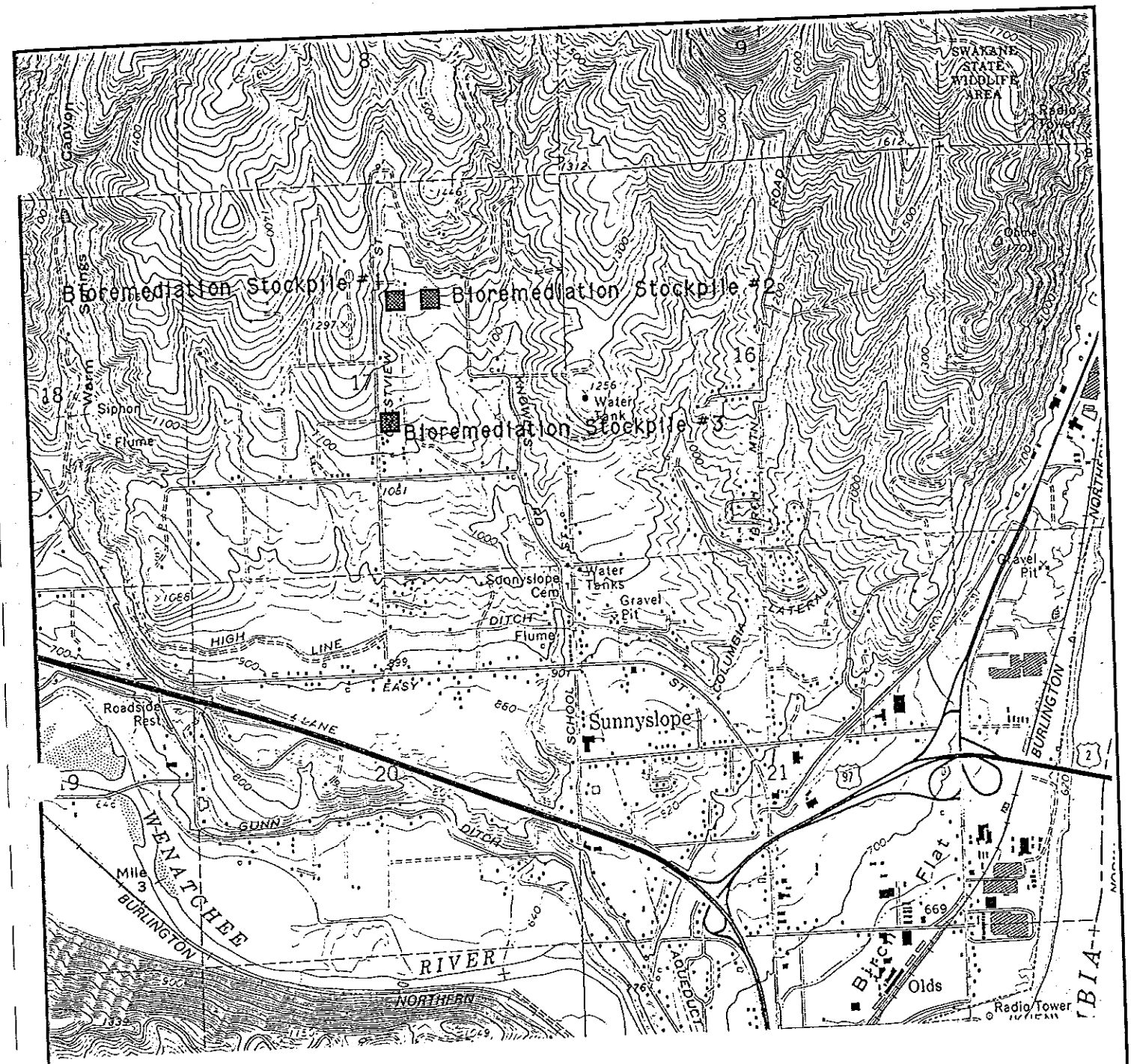
None.

2.3 *PETROLEUM-AFFECTED MATERIALS MANAGEMENT AND HANDLING PRACTICES*

A. Substance Identification and Quantities

During the UST removals, a total of 890 cubic yards (cy) of soil were excavated and stockpiled on bioremediation stockpiles lined with plastic. Approximately 590 cy of the soil was affected by petroleum-related compounds. This soil was placed in three bioremediation stockpiles in the site area(*Figure 4, Bioremediation Stockpile Locations*). The stockpile of clean soil was used to construct the bioremediation pad grades and berms.

Based on the results of laboratory analysis of stored soils and water from the associated borings and monitor wells, all soil cuttings, decontamination water and purge water associated with the installation of the borings and monitoring wells were added to the appropriate stockpiles (see *Section 2.3.1*).



WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY: Wenatchee, Washington

Supplemental Site Characterization Project

By: ERM-Enviroclean Northwest, Inc. June, 1994

Figure 5. Bioremediation Stockpile Locations Map

Base: USGS Wenatchee 7.5' Topographic Quadrangle (Photorevised 1988)

3.0 SAMPLING AND ANALYSIS PLAN

Soil samples were collected during drilling at each of the groundwater monitoring wells and soil borings (*Figure 2*). These samples were submitted to a qualified laboratory for chemical analyses.

3.1 FIELD INVESTIGATION AND SOIL REMEDIATION SAMPLING

Soil borings were drilled to install groundwater monitoring wells and characterize the soil in the vicinity of the former USTs. Sampling details are described below.

3.2 SAMPLING PROCEDURE

A truck-mounted, hollow-stem auger, rotary drill rig was used to collect soil samples on five-foot centers, starting at 5-feet below ground. A split-spoon sampler was driven approximately 18-inches deep using a 140-pound hammer dropped 30-inches onto the sampling device. The number of strikes per 6-inch advance for the sampler was noted and is included on the boring logs in *Appendix B*.

A representative portion of the soil in the split-spoon sampler was transferred into a laboratory-prepared glass sample container. Another representative portion was field-screened for organic vapors to assist in selection of samples for follow-up chemical characterization studies.

Soil samples were properly labeled, stored in a chilled container, and hand-delivered to a Washington State-certified laboratory (Pacific Northern Analytical in Redmond, Washington) under proper chain-of-custody protocols. A field logbook was maintained to document the field activities, problems encountered and other relevant information regarding the sampling.

4.0 REFERENCES

Sage Earth Sciences, Inc., 1993, *Interim Status Report for Closure Site Assessment and Independent Remedial Activities at the Birchmount Orchards Facility, Wenatchee, Washington*: Report to Wells & Wade Fruit Company, P.O Box 259, Wenatchee, WA dated November, 1993.

Sage Earth Sciences, 1994, *letter to Department of Ecology Central Region*: letter is stamped by WDOE 29 November 1993, and a note on the letter dated 12 January 1993 (corrected herein to mean 1994) reads "These tanks are farm "exempt" from Dept. of WDOE Regulations. No reporting is required. Karen (206) 407-7203."

APPENDIX A

ECOLOGY "FARM EXEMPT" LETTER

SAGE
Earth Sciences, Inc.
P.O. BOX 1644, ZILLAH, WA 98953
PHONE (509) 829-6400

November 22, 1993

Department of Ecology Central Region
Toxics Cleanup Program
106 South 6th Avenue
Yakima, WA 98902-3387

SUBJECT: INTERIM STATUS REPORT FOR CLOSURE SITE ASSESSMENT AND INDEPENDENT REMEDIAL ACTIVITIES AT THE BIRCHMOUNT ORCHARDS FACILITY, WENATCHEE, WA.

To whom it may concern,

Enclosed, please find one copy of the Interim Status Report for the above referenced site. Please call us at (509) 829-6400 if you have any questions.

Respectfully,
SAGE EARTH SCIENCES, INC.

David
Princip

1-12-93

THESE TANKS ARE FARM "EXEMPT" FROM DEPT. OF ECOLOGY REGS. NO REPORTING IS REQUIRED

KAREN
206-407-7203

Enclos
cc:

Project

APPENDIX B

SUBSURFACE EXPLORATION DATA

PROJECT NO. 94027

BORING LOG

SHEET 1 OF 2

PROJECT NAME: Birchmount
LOCATION: Wenatchee, WA
CLIENT NAME: Wells & Wade
SITE MANAGER: DC
LOGGED BY: AMA/DC

BORING NUMBER: B-5
BORING LOCATION:
DRILLING CONTRACTOR: Holt Drilling
DRILLING METHOD: HSA
BIT SZ/HAMMER/WT/DROP: 300#/30"
SAMPLE RETRIEVAL SYS: D&M mod.

DATE/TIME STARTED: 5/9/94 1000
DATE/TIME COMPLETED: 5/9/94 1115
TOTAL DEPTH: 49'
SURFACE ELEVATION:
WATER DEPTH:
CLOSURE METHOD: Bent. grout

DEPTH (Feet)	GRAPHIC LOG (Boulders / Cobbles / Pebbles / Gravel / Crs. Sand / Mod. Sand / Fine Sand / Silt / Clay)	Sample #	Blows / 6"	PID ~~OVA~~ (ppm)	CGI (% LEL)	Odor	Color	Moisture	Porosity (%)	USCS Symbols	DESCRIPTION
5	4.0					N	LB	DR		ML	Medium brown SILT some fine sand, dry, no odor
10	9.0			1.0		N	B	DR		SM	Medium brown fine to medium SAND with silt
15	12.5					N	B	DR		SM	Brown Fine SAND, some medium sand, some to with silt No recovery 12.5 - 14'
20		~~15~~	~~25/50-4"~~	3.6		N	LB	DR		SP	Light Brown fine to coarse SAND, none to some fine gravel, very dense
		18	40/45/50-5"	2.7		N	LB	DR			
25		23	45/51-5"	4.2		N	LB	SM		SP	Light brown fine SAND, some medium to coarse sand, trace silt, very dense
30		28	23/35/37	2.8		N	B	MO		ML	Brown SILT, hard
35	32.5	32.5	25/51-3"	3.3		N	B	DR		ML	32.5' - 32.6' Brown CLAY, Organic? Brown SILT, trace fine sand, caliche in fractures, nonplastic, weathered bedrock?, hard
		33		4.1							
40		3.0	50-4"			N	B	DR		ML	Brown SILT, trace fine sand, hard

Legend - see back

FIELD BORING LOG

ERM-EnviroClean Northwest, Inc.

Signature A. Michael Cull Date 5/16/94

BORING LOG

SHEET 2 OF 2

PROJECT NO. 94027
PROJECT NAME: Birchmount
LOCATION: Wenatchee, WA
CLIENT NAME: Wells & Wade
SITE MANAGER: DC
LOGGED BY: AMA

BORING NUMBER: B-6 (MW-4)
BORING LOCATION: ____
DRILLING CONTRACTOR: Holt Drilling
DRILLING METHOD: HSA
BIT SZ/HAMMER/WT/DROP: 300#/30"
SAMPLE RETRIEVAL SYS: D&M mod.

DATE/TIME STARTED: 5/9/94 1353
DATE/TIME COMPLETED: 5/9/94 1515
TOTAL DEPTH: 55'
SURFACE ELEVATION: ____
WATER DEPTH: ____
CLOSURE METHOD: ____

DEPTH (Feet)	GRAPHIC LOG (Boulders / Cobbles / Pebbles / Gravel / Crs. Sand / Med. Sand / Fine Sand / Silt / Clay)	Sample #	Blows / 6"	PID/OVA (ppm)	CGI (% LEL)	Odor	Color	Moisture	Porosity (%)	USCS Symbols	DESCRIPTION
45	Silt, Fine Sand, Gravel, Pebbles	43	50-2"	--		N	B	SM		ML	Brown SILT with fine sand, trace coarse sand and fine gravel, hard
						N	B	SM		ML	Brown SILT, hard
48.5	Fine Sand, Silt	48	50-6"	--		N	B	SM		SM	Brown fine SAND with silt, very dense
50	Fine Sand, Silt, Gravel	53	50-6"	0.5		N	B	SM		SP	Brown fine to medium SAND, trace fine gravel, very dense
55											Bottom of boring at 55.0 feet 5/9/94

Legend - see back

FIELD BORING LOG

ERM-EnviroClean Northwest, In

Signature R. Michael Cruse Date 5/16/94

BORING LOG

PROJECT NO. 94027 | SHEET 1 OF 2

PROJECT NAME: Birchmount
LOCATION: Wenatchee, WA
CLIENT NAME: Wells & Wade
SITE MANAGER: DC
LOGGED BY: AMA

BORING NUMBER: B-7 (MW-5)
BORING LOCATION:
DRILLING CONTRACTOR: Holt Drilling
DRILLING METHOD: HSA
BIT SZ/HAMMER/WT/DROP: 300#/30"
SAMPLE RETRIEVAL SYS: D&M mod.

DATE/TIME STARTED: 5/10/94 0733
DATE/TIME COMPLETED: 5/10/94 0843
TOTAL DEPTH: 49'
SURFACE ELEVATION:
WATER DEPTH:
CLOSURE METHOD:

DEPTH (Feet)	Boulders	Cobbles	Pebbles	Gravel	Crs. Sand	Med. Sand	Fine Sand	Silt	Clay	Sample #	Blows / 6"	PID (ppm)	CGI (% LEL)	Odor	Color	Moisture	Porosity (%)	USCS Symbols	DESCRIPTION
5							•	X						N	B	DR		ML	Brown SILT and fine sand
7.0						X		•		B	22	1.2		N	LB	DR		SP	Light brown fine to coarse SAND, trace fine gravel, very dense
8.5					•			•			28			N	B	DR		SP	Brown fine SAND, some silt, show fine gravel, very dense
10					•		X	•			40								
											22								Light brown fine to coarse SAND, trace to some fine gravel, very dense
15					•	•	X	•		13	50-6"	0.1		N	LB	DR		SP	
					•	•	X	•			30								Light brown fine to coarse SAND, some fine gravel, very dense
20					•	•	X	•		18	50-5"	1.4		N	LB	DR		SP	
						•	X	•			31								Light brown fine to coarse SAND, very dens
25						•	X	•		23	50-6"	1.5		N	LB	DR		SP	
								X			41								Light brown fine SAND, shaw silt, very dens
30								•		28	50-6"	1.5		N	LB	SM		SP	
								X			30								Brown SILT, trace fine sand, hard
35								•		33	50-6"	2.9		N	B	SM		ML	
								X			35								Brown SILT, trace fine sand, show coarse sand and gravel, hard, Caliche deposits
40								•		38	50-4½"	1.5		N	B	SM		ML	

Legend - see back

FIELD BORING LOG

ERM-EnviroClean Northwest, Inc

Signature G. Michael Cundell Date 5/16/94

BORING LOG

PROJECT NO. 94027 | SHEET 2 OF 2

PROJECT NAME: Birchmount
LOCATION: Wenatchee, WA
CLIENT NAME: Wells & Wade
SITE MANAGER: DC
LOGGED BY: AMA

BORING NUMBER: B-7 (MW-5)
BORING LOCATION:
DRILLING CONTRACTOR: Holt Drilling
DRILLING METHOD: HSA
BIT SZ/HAMMER/WT/DROP: 300#/30"
SAMPLE RETRIEVAL SYS: D&M mod.

DATE/TIME STARTED: 5/10/94 0733
DATE/TIME COMPLETED: 5/10/94 0843
TOTAL DEPTH: 49'
SURFACE ELEVATION:
WATER DEPTH:
CLOSURE METHOD:

DEPTH (Feet)	GRAPHIC LOG	Sample #	Blows / 6"	PID ~~OVA~~ (ppm)	CGI (% LEL)	Odor	Color	Moisture	Porosity (%)	USCS Symbols	DESCRIPTION
45	43.0	43	39	1.5		N	B	DR		ML	Brown SILT, some fine sand, hard
		43.5	50-5½"	1.3		N	B	DR		SP	Brown fine SAND, very dense
50		48	28 50-5½"	1.6		N	B	DR		ML	Brown SILT, hard, fractured, caliche on fractures
											Bottom of Boring 49.0 feet 5/10/94

Graphic log columns: Boulders, Cobbles, Pebbles, Gravel, Crs. Sand, Mod. Sand, Fine Sand, Silt, Clay

FIELD BORING LOG

ERM-EnviroClean Northwest, Inc

Legend - see back

Signature C. Michael Arnold Date 5/16/94

ERM-ENVIROCLEAN NORTHWEST, INC.
2821 Northup Way, Suite 100, Bellevue, WA 98004-1439; (206) 827-9574/Phone; (206) 827-2408/Fax

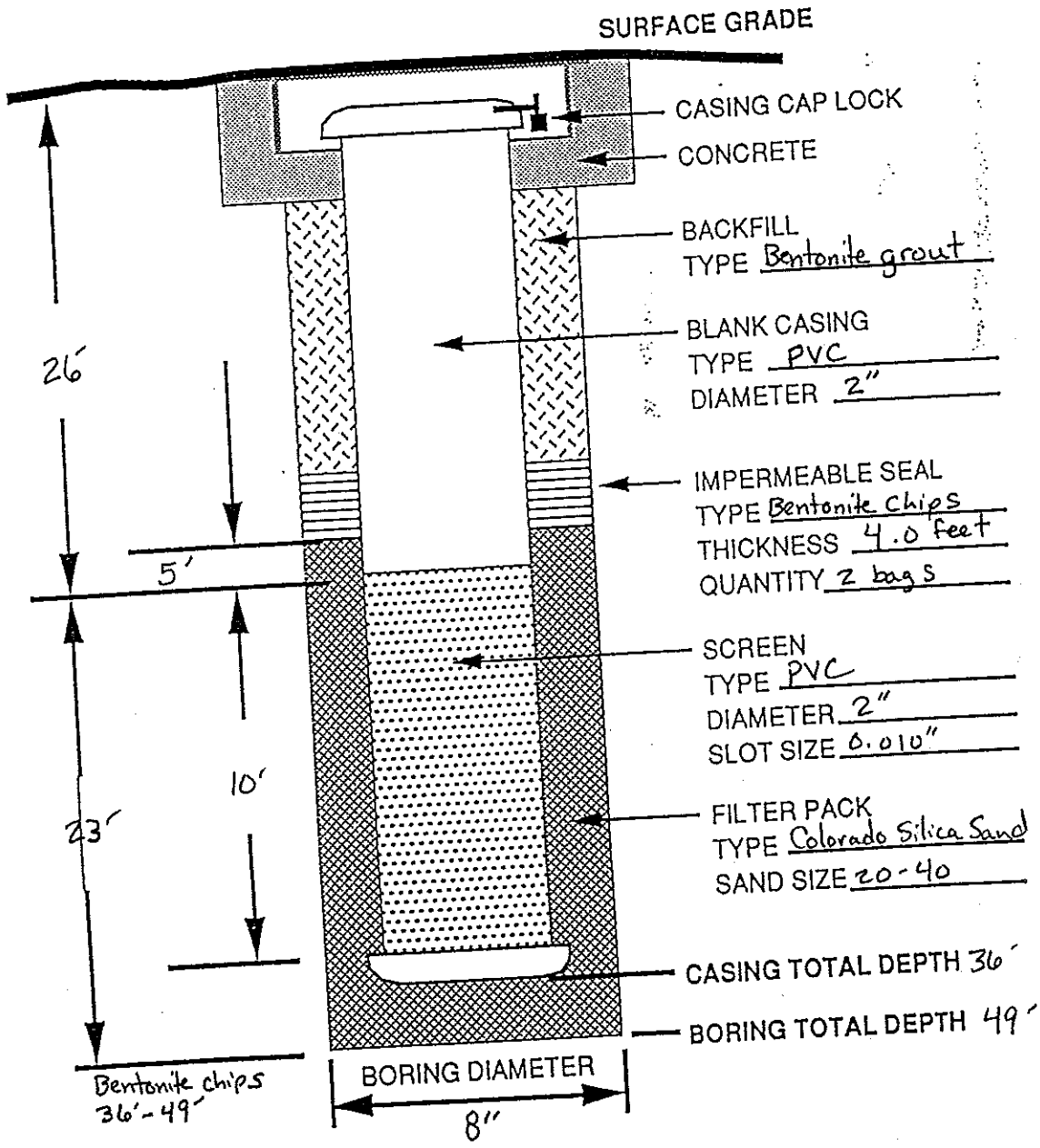
ERM

MONITORING WELL INSTALLATION REPORT

WELL NUMBER: MW-5
PROJECT NAME: Birchmount Orchards
ADDRESS: 3717 Crestview
Wenatchee, WA

TYPE OF WELL: Monitoring Well
INSTALLATION CONTRACTOR: Holt Drilling

INSTALLATION DATE: 5/10/94
SURFACE ELEVATION: (FT ABOVE MSL)
TOP OF CASING: (FT ABOVE MSL)
SURVEYED WELL LOCATION:
SITE MANAGER: DC



BORING LOG

PROJECT NO. 94027 | SHEET 1 OF 2

PROJECT NAME: Birchmount
LOCATION: Wenatchee, WA
CLIENT NAME: Wells & Wade
SITE MANAGER: DC
LOGGED BY: AMA

BORING NUMBER: B-6 (MW-4)
BORING LOCATION:
DRILLING CONTRACTOR: Holt Drilling
DRILLING METHOD: HSA
BIT SZ/HAMMER/WT/DROP: 300#/30"
SAMPLE RETRIEVAL SYS: D&M mod.

DATE/TIME STARTED: 5/9/94 1353
DATE/TIME COMPLETED: 5/9/94 1515
TOTAL DEPTH: 55'
SURFACE ELEVATION:
WATER DEPTH:
CLOSURE METHOD:

DEPTH (Feet)	Graphic Log (Boulders / Cobbles / Pebbles / Gravel / Crs. Sand / Mod. Sand / Fine Sand / Silt / Clay)	Sample #	Blows / 6"	PID ~~OVA~~ (ppm)	CGI (% LEL)	Odor	Color	Moisture	Porosity (%)	USCS Symbols	DESCRIPTION
						N	B	DR		ML	Brown SILT, some fine sand
5						N	B	DR		ML	Brown SILT with fine to medium sand
7.5		8	14 29 37	6.1		N	LB	DR		SP	Light brown fine to coarse SAND, some fine gravel, very dense
10											
15		13	19 39 50-5"	--		N	LB	DR		SP	
20		18	20 50-5"	2.6		N	LB	DR		SP	
25		23	30 50-6"	4.0		N	B	DR		SP	Brown fine to medium SAND, very dense
30		28	40 50-3"	4.9		N	LB	DR		SP	Light brown medium SAND, trace fine sand Very dense
35		33	28 50-4½"	4.8		N	B	DR		SM	Brown fine SAND with silt, very dense
40		38	23 50-6"			N	B	SM		ML	Brown SILT, trace fine sand, hard

Legend - see back

FIELD BORING LOG

ERM-EnviroClean Northwest, In

Signature G. Michael Connell Date 5/16/94

BORING LOG

SHEET 2 OF 2

PROJECT NO. 94027

PROJECT NAME: Birchmount
LOCATION: Wenatchee, WA
CLIENT NAME: Wells & Wade
SITE MANAGER: DC
LOGGED BY: AMA

BORING NUMBER: B-6 (MW-4)
BORING LOCATION:
DRILLING CONTRACTOR: Holt Drilling
DRILLING METHOD: HSA
BIT SZ/HAMMER/WT/DROP: 300#/30"
SAMPLE RETRIEVAL SYS: D&M Mod.

DATE/TIME STARTED: 5/9/94 1353
DATE/TIME COMPLETED: 5/9/94 1515
TOTAL DEPTH: 55'
SURFACE ELEVATION:
WATER DEPTH:
CLOSURE METHOD:

DEPTH (Feet)	GRAPHIC LOG (Boulders, Cobbles, Pebbles, Gravel, Crs. Sand, Med. Sand, Fine Sand, Silt, Clay)	Sample #	Blows / 6"	PID (ppm)	CGI (% LEL)	Odor	Color	Moisture	Porosity (%)	USCS Symbols	DESCRIPTION
45		43	50-2"	--		N	B	SM		ML	Brown SILT with fine sand, trace coarse sand and fine gravel, hard
						N	B	SM		ML	Brown SILT, hard
48.5 / 50		48	50-6"	--		N	B	SM		SM	Brown fine SAND with silt, very dense
55		53	50-6"	0.5		N	B	SM		SP	Brown fine to medium SAND, trace fine gravel, very dense
											Bottom of boring at 55.0 feet 5/9/94

Legend - see back

FIELD BORING LOG

ERM-EnviroClean Northwest, Inc

Signature A. Michael Arnold Date 5/16/94

ERM-ENVIROCLEAN NORTHWEST, INC.
2821 Northup Way, Suite 100, Bellevue, WA 98004-1439; (206) 827-9574/Phone; (206) 827-2408/Fax

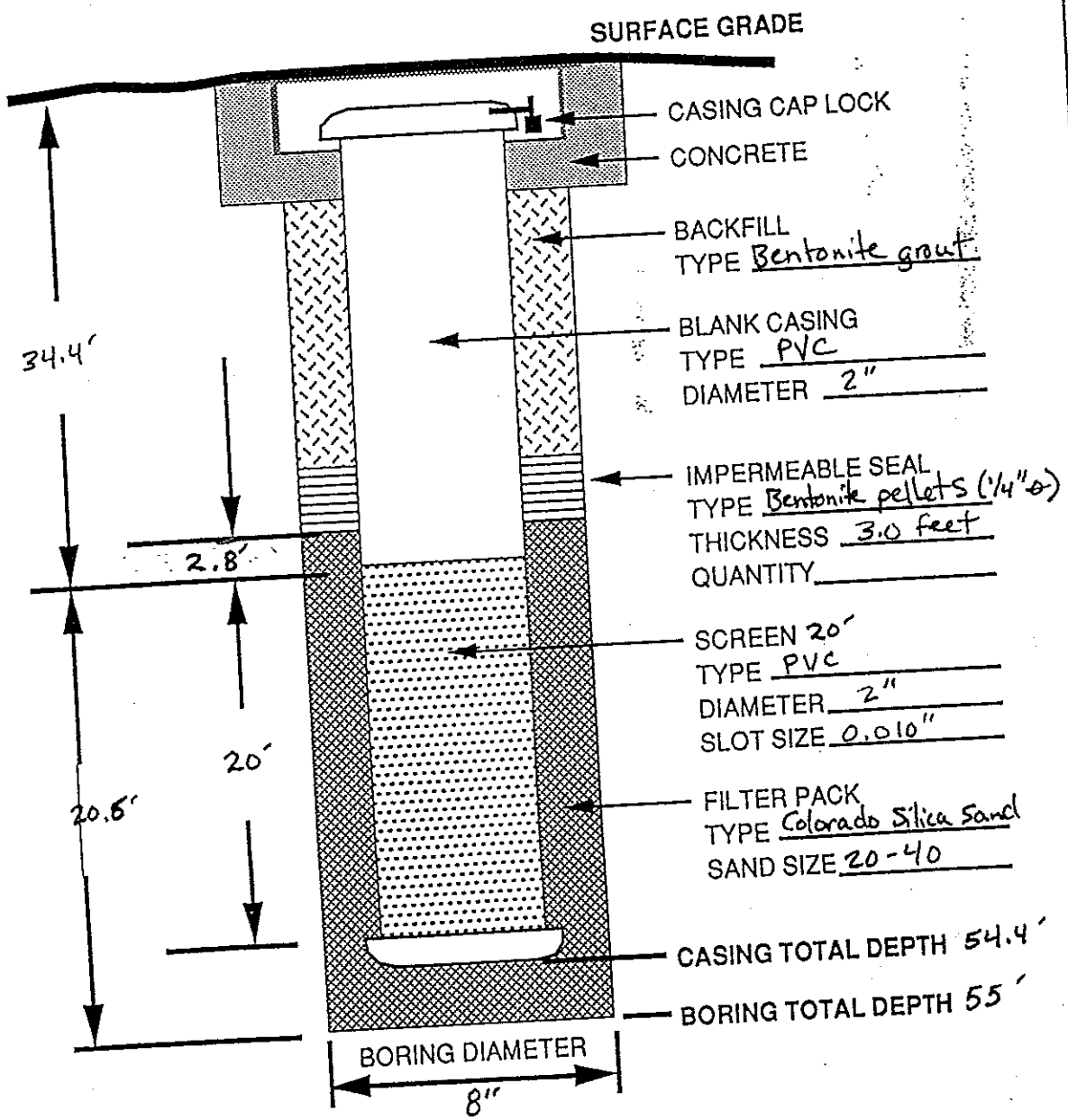
ERM

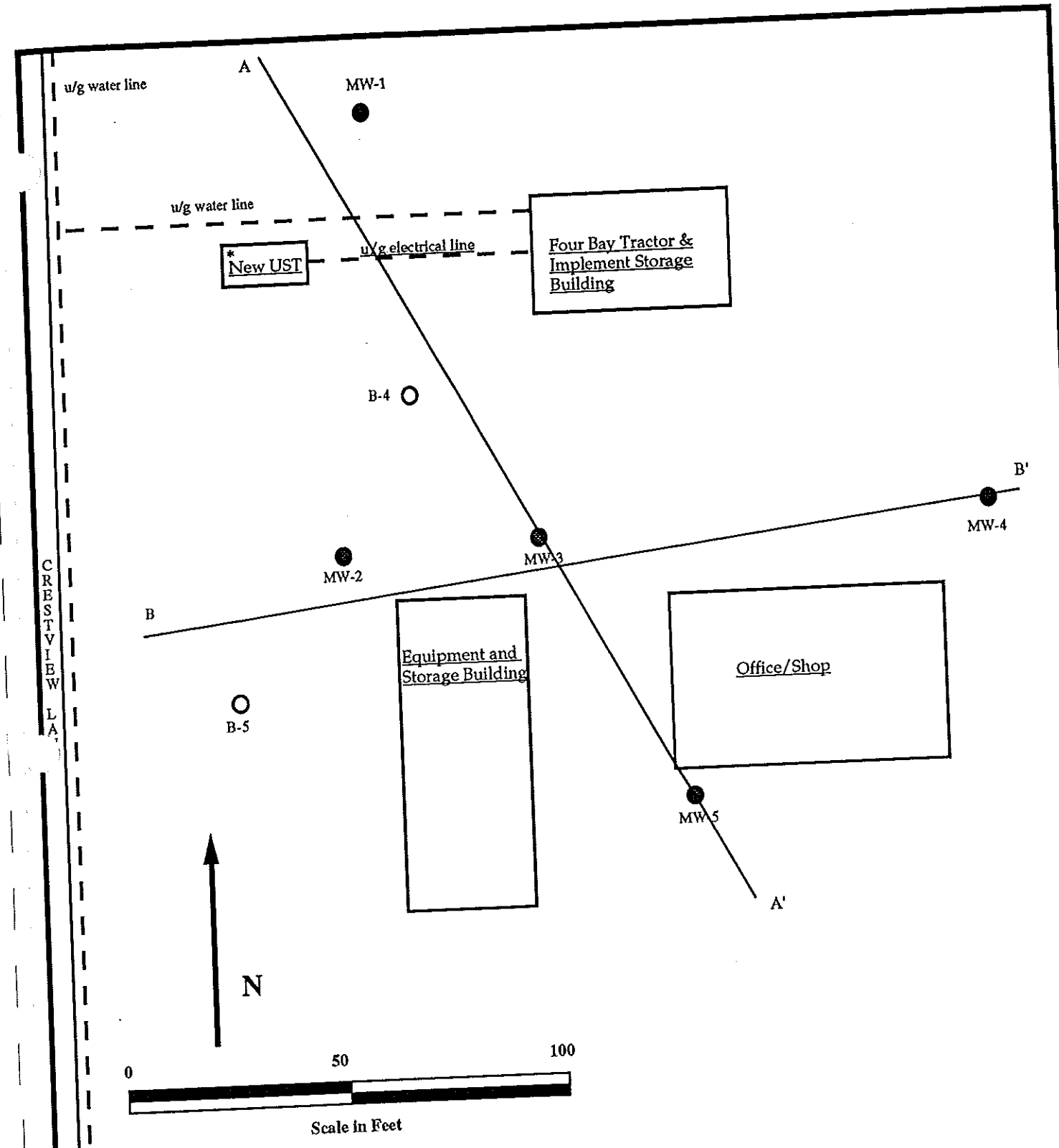
MONITORING WELL INSTALLATION REPORT

WELL NUMBER: MW-4
PROJECT NAME: Birchmount Orchards
ADDRESS: 3717 Crestview
Wenatchee, WA

TYPE OF WELL: Monitoring Well
INSTALLATION CONTRACTOR: Holt Drilling

INSTALLATION DATE: 5/9/94
SURFACE ELEVATION: (FT ABOVE MSL)
TOP OF CASING: (FT ABOVE MSL)
SURVEYED WELL LOCATION:
SITE MANAGER: DC





WELLS & WADE BIRCHMOUNT ORCHARDS FACILITY; Wenatchee, Washington
Supplemental Site Characterization Project
By: ERM-Enviroclean Northwest, Inc. June, 1994

Figure A-1. Geologic Cross-section Locations Map.

Note: All locations shown are approximate.

E R M

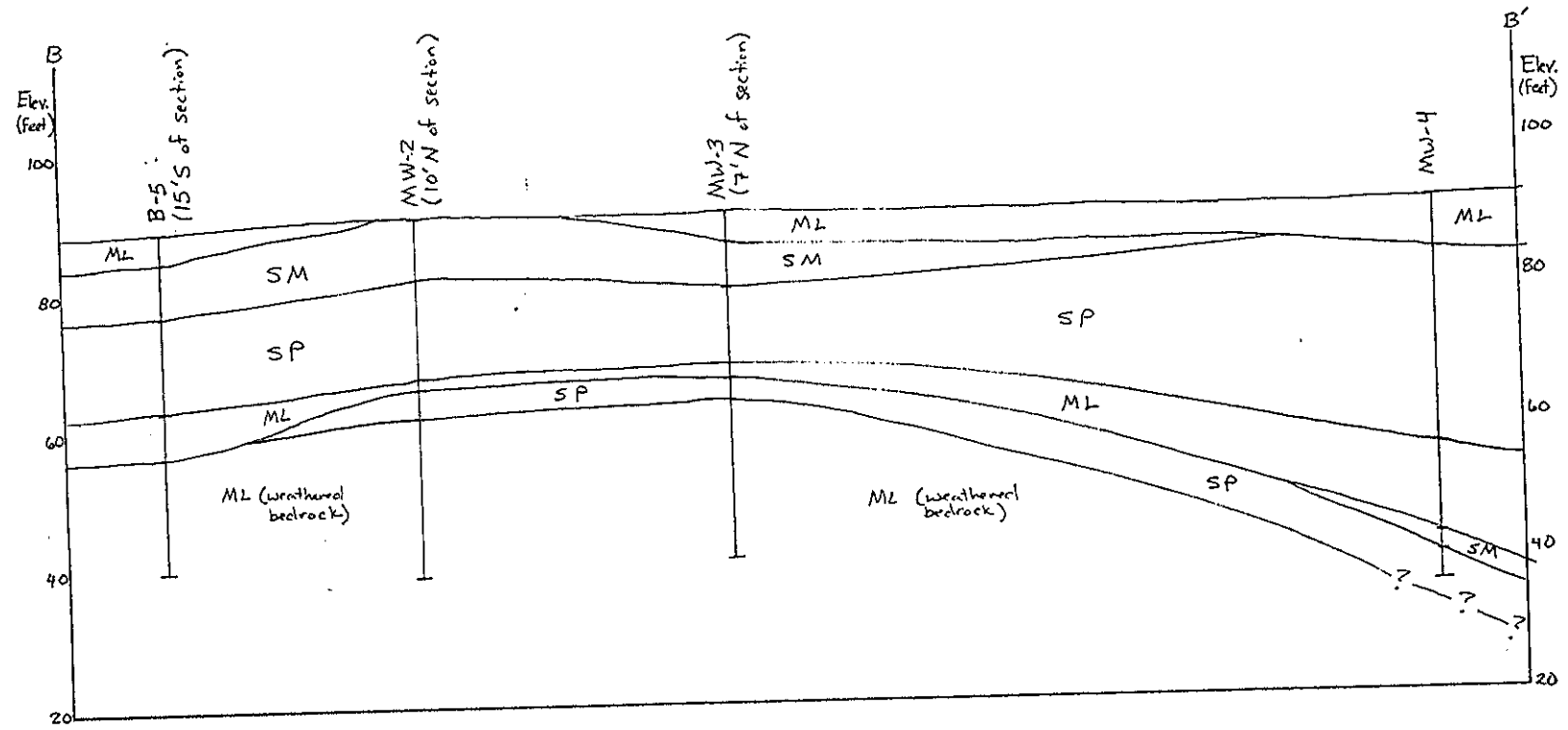


FIGURE A-3
GEOLOGIC CROSS-SECTION B-B'
BIRCHMOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

SCALE - 1"=25 feet

Elevations based on site-specific datum

ERM
EnviroClean

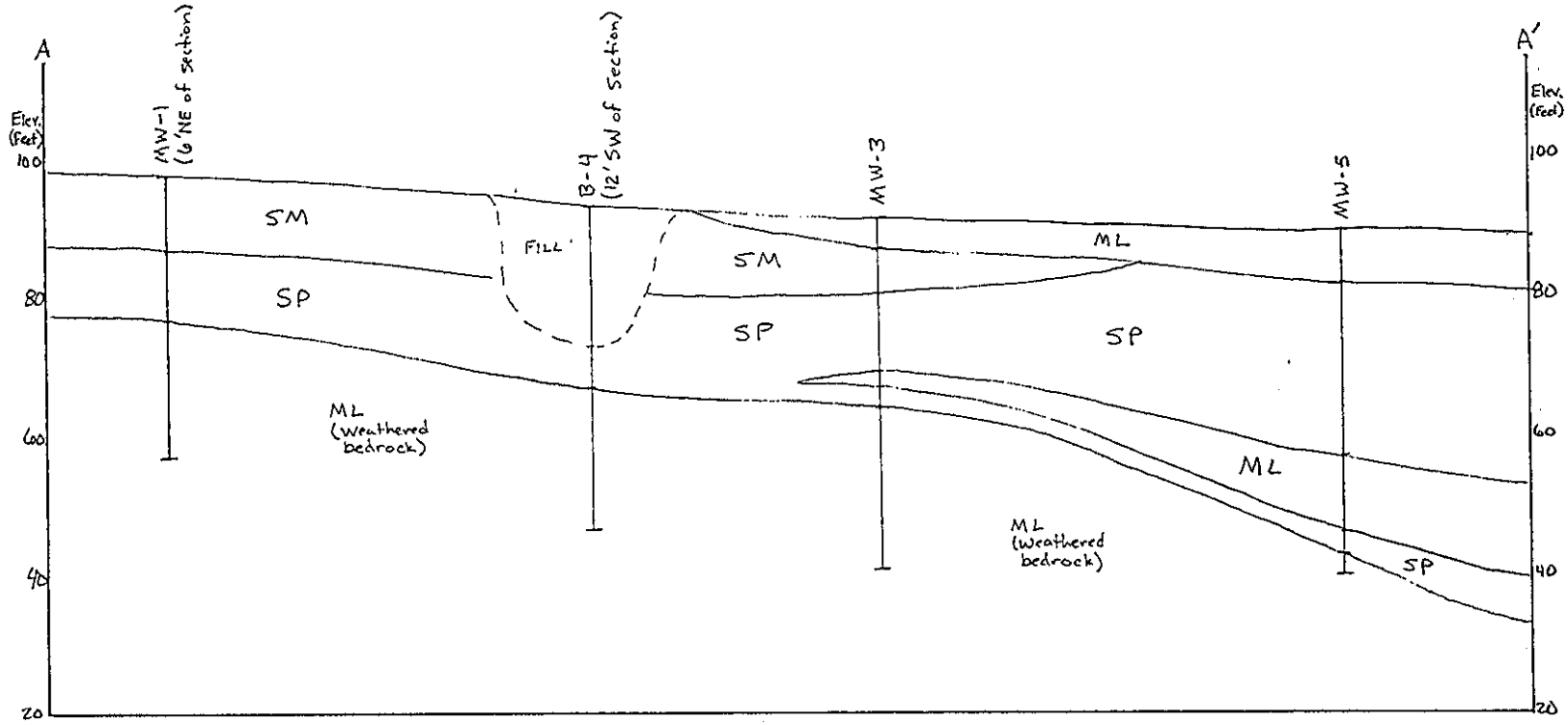


FIGURE A-2
GEOLOGIC CROSS-SECTION A-A'
BIRCH MOUNT ORCHARDS FACILITY
WENATCHEE, WASHINGTON

SCALE - 1" = 25 Feet

Elevations based on site-specific datum

ERM
EnviroClean

APPENDIX C

CHEMICAL ANALYTICAL DATA

Laboratory chemical analyses for samples included in this report were completed by Pacific Northern Analytical (PNA) in Redmond, Washington. Laboratory data sheets and chain-of-custody tracking forms are included in this Appendix.

PNA performed quality control/quality assurance (QA/QC) tests on all fuel sample batches completed for this report.

Our review of the QA/QC data provided by PNA did not identify any QA/QC concerns. It is ERM-EC's opinion that the laboratory data are suitable for their intended use.

Pacific
Northern
Analytical, Inc.

March 14, 1994

Gary Galloway
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Gary:

Enclosed are the analytical results of samples submitted on March 07, 1994 from project Wenatchee.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-821

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	March 3, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B3-S8**	Date Extracted:	March 10, 1994
Laboratory Batch #	01076	Date Analyzed:	March 11, 1994
Units:	mg/kg	Sample Matrix:	Soil
		Dilution Factor:	20

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	7200		50
Benzene	N.D.	D	0.050
Toluene	N.D.		1.0
Ethylbenzene	8.2		1.0
m- & p-Xylene	22		1.0
o-Xylene	1.3		1.0

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	86%		65%-111%
4-Bromofluorobenzene	90%		63%-111%

Notes

D-Data from 1:1 dilution.
Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

		Date Sampled:	March 4, 1994
Client:	ERM Northwest	Date Received:	March 7, 1994
Project Name:	Wenatchee	Date Extracted:	March 10, 1994
Client Sample ID:	**B4-S3**	Date Analyzed:	March 10, 1994
Laboratory Batch #	01076	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	280		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	0.19		0.050
m- & p-Xylene	0.51		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	80%		65%-111%
4-Bromofluorobenzene	93%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

		Date Sampled:	March 4, 1994
Client:	ERM Northwest	Date Received:	March 7, 1994
Project Name:	Wenatchee	Date Extracted:	March 10, 1994
Client Sample ID:	**B4-S5**	Date Analyzed:	March 10, 1994
Laboratory Batch #	01076	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	770	E	25
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	0.80		0.050
m- & p-Xylene	2.1		0.050
o-Xylene	0.12		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	79%		65%-111%
4-Bromofluorobenzene	96%		63%-111%

Notes

E-Data from 1:10 dilution.
Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Extracted:	March 10, 1994
Project Name:	Wenatchee	Date Analyzed:	March 10, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01076	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	92%		65%-111%
4-Bromofluorobenzene	95%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Extracted:	March 10, 1994
Project Name:	Wenatchee	Date Analyzed:	March 10, 1994
Batch Sample ID:	01076 QA	Sample Matrix:	Soil
Laboratory Batch #	01076	**Units:**	**mg/kg**

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	N.D.	N.D.	--	20%	
Benzene	0.050	N.D.	N.D.	--	20%	
Toluene	0.050	N.D.	N.D.	--	20%	
Ethylbenzene	0.050	N.D.	N.D.	--	20%	
m- & p-Xylene	0.050	N.D.	N.D.	--	20%	
o-Xylene	0.050	N.D.	N.D.	--	20%	

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Benzene	1.0	76%	60%-140%	77%	1%	20%
o-Xylene	1.0	79%	60%-140%	80%	1%	20%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**EC-MW-1**	Date Analyzed:	March 10, 1994
Laboratory Batch #	01076	Sample Matrix:	Water
Units:	ug/L	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		50
Benzene	N.D.		1
Toluene	1		1
Ethylbenzene	N.D.		1
m- & p-Xylene	N.D.		1
o-Xylene	N.D.		1

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	88%		71%-118%
4-Bromofluorobenzene	90%		70%-120%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	March 5, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**EC-MW-2**	Date Analyzed:	March 10, 1994
Laboratory Batch #	01076	Sample Matrix:	Water
Units:	**ug/L**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	120		50
Benzene	N.D.		1
Toluene	5		1
Ethylbenzene	N.D.		1
m- & p-Xylene	6		1
o-Xylene	2		1

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		71%-118%
4-Bromofluorobenzene	88%		70%-120%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	March 5, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**EC-MW-3**	Date Analyzed:	March 10, 1994
Laboratory Batch #	01076	Sample Matrix:	Water
Units:	**ug/L**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	13,000	G	500
Benzene	17		1
Toluene	2		1
Ethylbenzene	63		1
m- & p-Xylene	120	G	10
o-Xylene	5		1

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	90%		71%-118%
4-Bromofluorobenzene	88%		70%-120%

Notes

G-Data from 1:10 dilution.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B4-W1**	Date Analyzed:	March 10, 1994
Laboratory Batch #	01076	Sample Matrix:	Water
Units:	**ug/L**	Dilution Factor:	10

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	13,000		500
Benzene	5	F	5
Toluene	5	F	5
Ethylbenzene	67		10
m- & p-Xylene	170		10
o-Xylene	6	F	5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	80%		71%-118%
4-Bromofluorobenzene	84%		70%-120%

Notes

F-Data from 1:5 dilution.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Analyzed:	March 10, 1994
Project Name:	Wenatchee	Dilution Factor:	1
Sample ID:	Method Blank 2	Units:	ug/L
Laboratory Batch #	01076		

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		50
Benzene	N.D.		1
Toluene	N.D.		1
Ethylbenzene	N.D.		1
m- & p-Xylene	N.D.		1
o-Xylene	N.D.		1

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		71%-118%
4-Bromofluorobenzene	86%		70%-120%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Analyzed:	March 10, 1994
Project Name:	Wenatchee	Sample Matrix:	Water
Batch Sample ID:	**01076 QA2**	**Units:**	**ug/L**
Laboratory Batch #	01076		

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	50	N.D.	N.D.	--	20%	
Benzene	1	N.D.	N.D.	--	20%	
Toluene	1	1	1	<1%	20%	
Ethylbenzene	1	N.D.	N.D.	--	20%	
m- & p-Xylene	1	N.D.	N.D.	--	20%	
o-Xylene	1	N.D.	N.D.	--	20%	

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Benzene	20	93%	75%-125%	92%	1%	20%
o-Xylene	20	92%	75%-125%	91%	1%	20%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Client:	ERM Northwest	Date Sampled:	March 2, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B1-S5**	Date Extracted:	March 8, 1994
Laboratory Batch #	01076	Date Analyzed:	March 8, 1994
Units:	mg/kg	Sample Matrix:	Soil
		Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	N.D.		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	112%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

		Date Sampled:	March 2, 1994
Client:	ERM Northwest	Date Received:	March 7, 1994
Project Name:	Wenatchee	Date Extracted:	March 8, 1994
Client Sample ID:	**B2-S10**	Date Analyzed:	March 8, 1994
Laboratory Batch #	01076	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	N.D.		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	106%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

		Date Sampled:	March 3, 1994
Client:	ERM Northwest	Date Received:	March 7, 1994
Project Name:	Wenatchee	Date Extracted:	March 8, 1994
Client Sample ID:	**B3-S8**	Date Analyzed:	March 8, 1994
Laboratory Batch #	01076	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	Detected		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	108%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Client:	ERM Northwest	Date Sampled:	March 3, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B3-S10**	Date Extracted:	March 8, 1994
Laboratory Batch #	01076	Date Analyzed:	March 8, 1994
Units:	mg/kg	Sample Matrix:	Soil
		Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	N.D.		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	103%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B4-S3**	Date Extracted:	March 8, 1994
Laboratory Batch #	01076	Date Analyzed:	March 8, 1994
Units:	**mg/kg**	Sample Matrix:	Soil
		Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	Detected		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	Detected		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	114%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B4-S5**	Date Extracted:	March 8, 1994
Laboratory Batch #	01076	Date Analyzed:	March 8, 1994
Units:	**mg/kg**	Sample Matrix:	Soil
		Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	Detected		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	108%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID
Quality Control Data

Client:	ERM Northwest		
Project Name:	Wenatchee	Date Extracted:	March 8, 1994
Sample ID:	Method Blank	Date Analyzed:	March 8, 1994
Laboratory Batch #	01076	Dilution Factor:	0.5/2
Units:	mg/kg		

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	N.D.		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	109%		65%-144%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**EC-MW-1**	Date Extracted:	March 10, 1994
Laboratory Batch #	01076	Date Analyzed:	March 10, 1994
Units:	**mg/L**	Sample Matrix:	Water
		Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		0.15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	95%		50%-150%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	March 5, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**EC-MW-2**	Date Extracted:	March 10, 1994
Laboratory Batch #	01076	Date Analyzed:	March 10, 1994
Units:	**mg/L**	Sample Matrix:	Water
		Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	0.23		0.15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	93%		50%-150%

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	March 5, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**EC-MW-3**	Date Extracted:	March 10, 1994
Laboratory Batch #	01076	Date Analyzed:	March 10, 1994
Units:	**mg/L**	Sample Matrix:	Water
		Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	0.30		0.15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	70%		50%-150%

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B4-W1**	Date Extracted:	March 10, 1994
Laboratory Batch #	01076	Date Analyzed:	March 10, 1994
Units:	**mg/L**	Sample Matrix:	Water
		Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	0.63		0.15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	53%		50%-150%

DOE WTPH-D
Quality Control Data

Client:	ERM Northwest	Date Extracted:	March 11, 1994
Project Name:	Wenatchee	Date Analyzed:	March 11, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01076	**Units:**	mg/kg

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	99%		50%-150%

Batch Sample ID:	01084 QA	Date Extracted:	March 11, 1994
		Date Analyzed:	March 11, 1994
Units:	mg/kg	Sample Matrix:	Soil

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	15	N.D.	N.D.	--	24%

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	125	112%	60%-140%	109%	3%	27%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-D
Quality Control Data

Client:	ERM Northwest	Date Extracted:	March 10, 1994
Project Name:	Wenatchee	Date Analyzed:	March 10, 1994
Sample ID:	**Method Blank 2**	Dilution Factor:	1
Laboratory Batch #	01076	**Units:**	mg/L

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		0.15

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	95%		50%-150%

Batch Sample ID:	01076 QA	Date Extracted:	March 10, 1994
Units:	mg/L	Date Analyzed:	March 10, 1994
		Sample Matrix:	Water

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	0.15	0.63	0.73	15%	24%

Batch Sample ID: 01076 QA

Analyte	Spike Added	Spike Recovery	Acceptance Range
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	1.25	108%	60%-140%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-D Extended

Client:	ERM Northwest	Date Sampled:	March 4, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Client Sample ID:	**B4-S3**	Date Extracted:	March 11, 1994
Laboratory Batch #	01076	Date Analyzed:	March 14, 1994
Units:	mg/kg	Sample Matrix:	Soil
		Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	71		15
Total Petroleum Hydrocarbons as Motor Oil (Beyond tetracosane)	76		50

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	98%		50%-150%

Notes

Sample results have been corrected to their dry weight values.

DOE WTPH-D Extended
Quality Control Data

Client:	ERM Northwest	Date Extracted:	March 11, 1994
Project Name:	Wenatchee	Date Analyzed:	March 11, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01076	Units:	mg/kg

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		15
Total Petroleum Hydrocarbons as Motor Oil (Beyond tetracosane)	N.D.		50

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	99%		50%-150%

Batch Sample ID:	01084 QA	Date Extracted:	March 11, 1994
Units:	mg/kg	Date Analyzed:	March 11, 1994
		Sample Matrix:	Soil

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel	15	N.D.	N.D.	--	24%
Total Petroleum Hydrocarbons as Motor Oil	50	N.D.	N.D.	--	24%

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel	125	112%	60%-140%	109%	3%	27%

Notes

N.D.-Not detected above the reporting limit.

Moisture Content Report

Client:	ERM Northwest	Date Sampled:	March 3, 1994
Project Name:	Wenatchee	Date Received:	March 7, 1994
Laboratory Batch #	01076	Date Analyzed:	March 8, 1994
Units:	**% Moisture**	Sample Matrix:	Soil

Client Sample ID	Sample Result	Notes	Reporting Limit
B1-S5	3%		1%
B2-S10	18%		1%
B3-S8	15%		1%
B3-S10	23%		1%
B4-S3	10%		1%
B4-S5	19%		1%
LW-SP1	5%		1%
LW-SP2	5%		1%

F 1 of 4

Pac..ic Northern Analytical

Chain of Custody/Analysis Rec st Form

Laboratory Batch Number: 010.16

Client: ERM-EC | Report to: Gary Galloway / Tom Cammarata | Project Name: Wenatchee | Project Number:

Address: 2821 Northup WAY, suite 108
Bellevue, WA 98004-1439

Phone Number: 206-827-9574
Fax Number: 206-827-2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID *	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
-1 B1-S1	3-2	0815	S	1																
-2 B1-S2	3-2	0820	S	1																
-3 B1-S3	3-2	0826	S	1																
-4 B1-S5	3-2	0840	S	1									X		X	X				
-5 B1-S7	3-2	0850	S	1																
-6 B1-S8	3-2	0900	S	1																
-7 B1-S9	3-2	0930	S	1																
-8 B1-S10	3-2	0945	S	1																
-9 B2-S1	3-2	1300	S	1																
-10 B2-S2		1315	S	1																

P.O.#
Bill to: ERM-EC

Turnaround Requested:
24 hr (+100%)
✓ 48 hr (+50%) (HCID)
Date needed

Sample Receipt:
Condition: Good
Cool? (Yes) No

Comments/Special Instructions:
Hold non-analyzed soil samples for disposal instruction - ARCHIVE till further instructions.

* BASED on HCID results run WTPH-G if gas and WTPH-D if diesel. If both gas and diesel present run G+D.

** Any questions call T. Cammarata 633-3783

Relinquished By: Stacey Mast — Date: 3-7-04
Company: PNA — Time: 11:20 am
Received By: Thom Cammarata — Date: 3-7-04
Company: ERM-EC — Time: 1120

Relinquished By: — Date:
Company: — Time:
Received By: — Date:
Company: — Time:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pac...c Northern Analytical

Chain of Custody/Analysis Req ...t Form

Laboratory Batch Number: 01014

Client: ERM-EC | Report to: Gary Galloway / Tom Cammarata | Project Name: Wenatchee | Project Number:

Address: 2821 Northup Way Suite 100, Bellevue, WA 98004

Phone Number: 206-827-9574

Fax Number: 206-827-2408

	Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID *	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
11	~~1~~ B2-S3	3-2	1330	S	1																
1	-2 B2-S4	3-2	1345	S	1																
1	-3 B2-S5	3-2	1400	S	1																
1	-4 B2-S6	3-2	1415	S	1																
1	-5 B2-S7	3-2	1430	S	1																
1	-6 B2-S8	3-2	1445	S	1																
1	-7 B2-S9	3-2	1553	S	1									X		X	X				
1	-8 B2-S10	3-2	1610	S	1																
1	-9 B2-S11	3-2	1621	S	1																
20	~~10~~ B3-S1	3-3	1000	S	1																

P.O.#

Bill to:

Turnaround Requested:
24 hr (+100%)
✓ 48 hr (+50%) (HCID)
Date needed

Sample Receipt:
Condition: good
Cool? Yes No

Comments/Special Instructions:
Archive SOIL Samples till further instructions.
* If HCID show gas run WTPH-G, if diesel run WTPH-D, or both if both fuel present.
Any questions call Tom Cammarata 633-3783

Relinquished By:	Tom Comm	Date: 3-7-94
Company:	ERM-EC	Time: 1120
Received By:	Stacey Mott	Date: 3-7-94
Company:	PNA	Time: 11:20 AM
Relinquished By:		Date:
Company:		Time:
Received By:		Date:
Company:		Time:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pg 3a.

Pacific Northern Analytical

Chain of Custody/Analysis Request Form

Laboratory Batch Number: 01016

Client: ERM-EC Report to: Gary Galloway / Tom Cammarata Project Name: Wenatchee Project Number:

Address: 2821 Northup WAY, Suite 100
Bellevue, WA 98004-1439

Phone Number: 206-827-9514
Fax Number: 206-827-2408

	Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID *	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/ TOX / TX
2	-1 B3-S2	3-3	1015	S	1									X		X	X				
2	-2 B3-S4	3-3	1045	S	1																
2	-3 B3-S5	3-3	1055	S	1																
2	-4 B3-S6	3-3	1105	S	1																
2	-5 B3-S7	3-3	1135	S	1																
2	-6 B3-S8	3-3	1145	S	1																
2	-7 B3-S9	3-3	1413	S	1									X		X	X				
2	-8 B3-S10	3-3	1430	S	1																
2	-9 B4-S1	3-4	0745	S	1																
30	-10 B4-S2	3-4	0800	S	1																

P.O.#
Bill to:

Turnaround Requested:
24 hr (+100%)
48 hr (+50%) HCID.
Date needed

Sample Receipt:
Condition: Good
Cool? Yes / No

Comments/Special Instructions:
Archive SOIL samples till further instruction.
* Base of HCID Run TPH-G or TPH-D or both if required.
Any questions call Tom Cammarata 633-3783

Relinquished By: Thom Cammarata Date: 3-7-94 Time: 1120
Company: ERM-EC
Received By: Stacey Most Date: 3-7-94 Time: 11:20am
Company: PNA
Relinquished By: Date: Time:
Company:
Received By: Date: Time:
Company:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Page 1 of

Pac...c Northern Analytical

Chain of Custody/Analysis Req t Form

Laboratory Batch Number: 010.6

Client: ERM-EC Report to: Gary Galloway / Tom Cammarata Project Name: Vaatchell Project Number:

Address: 2821 Northup Way Suite 100

Phone Number: 206-827-9514

Fax Number: 206-827-2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX *	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID *	WTPH-D/DEQ TPH-D *	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC / TOX / TX
3-1 B4-S3	3-4	0825	S	1									X	X			X			
3-2 B4-S4	3-4	0835	S	1									X	X	X	X				
3-3 B4-S5	3-4	0845	S	1																
3-4 B4-S6	3-4	0855	S	1									X			X				
3-5 EC-MW-1	3-4	1742	W	3									X			X				
3-6 EC-MW-2	3-5	0852	W	3									X			X				
3-7 EC-MW-3	3-5	1100	W	3									X			X				
3-8 B4-W1	3-4	0930	W	3									X			X				
3-9 LW-S1	3-3	1105	S	1									X			X				
40-10 LW-S2	3-3	1140	S	1									X							

P.O.#

Bill to:

Turnaround Requested:
24 hr (+100%)
48 hr (+50%) (HCID).
Date needed

Sample Receipt:
Condition: good
Cool? Yes / No

Comments/Special Instructions:
Archieve. SOIL Samples till further instructions.
* MW-1 associated w/ B1-S# Sampled MW-2 ass/w B2-S# samples etc.
Water Samples very silty.
* Base on HCID Run TPH-G or D or both if necessary.

Relinquished By: [signature]
Company: ERM-EC
Received By: Stacey Mott
Company: PNA
Date: 3-7-94
Time: 11:20

Relinquished By:
Company:
Received By:
Company:
Date:
Time:

By signing this form, you are agreeing to the terms and conditions listed on the back.

Any questions Call Tom Cammarata 633-3783.

Distribution: White - Return to Originator; Yellow - Lab; Pink - Retained by Originator

Pacific
Northern
Analytical, Inc.

May 18, 1994

Don Clabaugh
ERM Northwest
2821 Northup Way
Bellevue, WA 98004

Dear Don:

Enclosed are the analytical results of samples submitted on May 11, 1994 from project Wells and Wade, 9404.11.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-82

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	**B-5-33**	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	81%		65%-111%
4-Bromofluorobenzene	90%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	B-6-8	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	87%		65%-111%
4-Bromofluorobenzene	92%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	**B-6-53**	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	83%		65%-111%
4-Bromofluorobenzene	89%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G

Client:	ERM Northwest	Date Sampled:	May 10, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	**B-7-48**	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	85%		65%-111%
4-Bromofluorobenzene	92%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Analyzed:	May 16, 1994
Client Sample ID:	**B5**	Sample Matrix:	Water
Laboratory Batch #	01255	Dilution Factor:	1
Units:	ug/L		

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		50
Benzene	N.D.		1
Toluene	N.D.		1
Ethylbenzene	N.D.		1
m- & p-Xylene	N.D.		1
o-Xylene	N.D.		1

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	94%		71%-118%
4-Bromofluorobenzene	97%		70%-120%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	B-5-43	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	89%		65%-111%
4-Bromofluorobenzene	96%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	**B-6-33**	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	75%		65%-111%
4-Bromofluorobenzene	81%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Client:	ERM Northwest	Date Sampled:	May 10, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 12, 1994
Client Sample ID:	**B-7-33**	Date Analyzed:	May 12, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	mg/kg	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	76%		65%-111%
4-Bromofluorobenzene	80%		63%-111%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest		
Project Name:	Wells and Wade	Date Extracted:	May 12, 1994
Project Number:	9404.11	Date Analyzed:	May 12, 1994
Sample ID:	**Method Blank**	Dilution Factor:	1
Laboratory Batch #	01255	**Units:**	**mg/kg**

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		2.5
Benzene	N.D.		0.050
Toluene	N.D.		0.050
Ethylbenzene	N.D.		0.050
m- & p-Xylene	N.D.		0.050
o-Xylene	N.D.		0.050

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	96%		65%-111%
4-Bromofluorobenzene	94%		63%-111%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest		
Project Name:	Wells and Wade	Date Extracted:	May 12, 1994
Project Number:	9404.11	Date Analyzed:	May 12, 1994
Batch Sample ID:	**01250 QA**	Sample Matrix:	Soil
Laboratory Batch #	01255	**Units:**	mg/kg

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	2.5	N.D.	N.D.	--	20%	
Benzene	0.050	N.D.	N.D.	--	20%	
Toluene	0.050	N.D.	N.D.	--	20%	
Ethylbenzene	0.050	N.D.	N.D.	--	20%	
m- & p-Xylene	0.050	N.D.	N.D.	--	20%	
o-Xylene	0.050	N.D.	N.D.	--	20%	

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Benzene	1.0	84%	60%-140%	85%	1%	20%
o-Xylene	1.0	85%	60%-140%	87%	2%	20%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest		
Project Name:	Wells and Wade	Date Analyzed:	May 16, 1994
Project Number:	9404.11	Dilution Factor:	1
Sample ID:	Method Blank	Units:	ug/L
Laboratory Batch #	01255		

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Gasoline (Toluene to dodecane)	N.D.		50
Benzene	N.D.		1
Toluene	N.D.		1
Ethylbenzene	N.D.		1
m- & p-Xylene	N.D.		1
o-Xylene	N.D.		1

Surrogate Recoveries	% Recovery	Notes	Acceptance Range
Fluorobenzene	86%		71%-118%
4-Bromofluorobenzene	88%		70%-120%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-G with BTEX (EPA 8020) distinction

Quality Control Data

Client:	ERM Northwest	Date Analyzed:	May 16, 1994
Project Name:	Wells and Wade	Sample Matrix:	Water
Project Number:	9404.11	Units:	ug/L
Batch Sample ID:	**01255 QA**		
Laboratory Batch #	01255		

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit	Notes
Total Petroleum Hydrocarbons as Gasoline	50	N.D.	N.D.	--	20%	
Benzene	1	N.D.	N.D.	--	20%	
Toluene	1	N.D.	N.D.	--	20%	
Ethylbenzene	1	N.D.	N.D.	--	20%	
m- & p-Xylene	1	N.D.	N.D.	--	20%	
o-Xylene	1	N.D.	N.D.	--	20%	

Analyte	Spike Added	Spike Recovery	Acceptance Range	Spike Dup Recovery	RPD	Acceptance Limit
Benzene	20	102%	75%-125%	105%	3%	20%
o-Xylene	20	130%	75%-125%	105%	2%	20%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Client:	ERM Northwest	Date Sampled:	May 10, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 17, 1994
Client Sample ID:	**B-1-9.5**	Date Analyzed:	May 17, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	Detected		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	Detected		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	--	I	65%-144%

Notes

I-Interferences prevented quantitation of the surrogate recovery.
Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Client:	ERM Northwest	Date Sampled:	May 10, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 17, 1994
Client Sample ID:	**B-1-25.5**	Date Analyzed:	May 17, 1994
Laboratory Batch #	01255	Sample Matrix:	Soil
Units:	**mg/kg**	Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	Detected		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	Detected		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	94%		65%-144%

Notes

Sample results have been corrected to their dry weight values.
N.D.-Not detected above the reporting limit.

DOE WTPH-HCID

Quality Control Data

Client:	ERM Northwest		
Project Name:	Wells and Wade		
Project Number:	9404.11		
Sample ID:	**Method Blank**	Date Extracted:	May 17, 1994
Laboratory Batch #	01255	Date Analyzed:	May 17, 1994
Units:	mg/kg	Dilution Factor:	0.5/2

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as gasoline (Toluene to dodecane)	N.D.		20
Total Petroleum Hydrocarbons as diesel fuel (Dodecane to tetracosane)	N.D.		50
Total Petroleum Hydrocarbons as lube oil or related products (Beyond tetracosane)	N.D.		100

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	95%		65%-144%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-D

Client:	ERM Northwest	Date Sampled:	May 9, 1994
Project Name:	Wells and Wade	Date Received:	May 11, 1994
Project Number:	9404.11	Date Extracted:	May 16, 1994
Client Sample ID:	**B-5**	Date Analyzed:	May 16, 1994
Laboratory Batch #	01255	Sample Matrix:	Water
Units:	**mg/L**	Dilution Factor:	1

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		0.25

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	85%		50%-150%

Notes

N.D.-Not detected above the reporting limit.

DOE WTPH-D
Quality Control Data

Client:	ERM Northwest	Date Extracted:	May 16, 1994
Project Name:	Wells and Wade	Date Analyzed:	May 17, 1994
Project Number:	9404.11	Dilution Factor:	1
Sample ID:	**Method Blank**	**Units:**	mg/L
Laboratory Batch #	01255		

Analyte	Sample Result	Notes	Reporting Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	N.D.		0.25

Surrogate Recovery	% Recovery	Notes	Acceptance Range
o-terphenyl	100%		50%-150%

Batch Sample ID:	01262 QA	Date Extracted:	May 16, 1994
Units:	mg/L	Date Analyzed:	May 16, 1994
		Sample Matrix:	Water

Analyte	Reporting Limit	Sample Result	Duplicate Result	RPD	Acceptance Limit
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	2.5	19	21	10%	24%

Batch Sample ID:	Blank Spike		
Analyte	Spike Added	Spike Recovery	Acceptance Range
Total Petroleum Hydrocarbons as Diesel Fuel (Dodecane to tetracosane)	1.0	133%	60%-140%

Notes

N.D.-Not detected above the reporting limit.

Pacific Northern Analytical

Chain of Custody/Analysis Request Form
Laboratory Batch Number: 01255

Client: ERM | Report to: Don Clabaugh | Project Name: Wells and Wade | Project Number: 9404.11

Address: 2821 Northup Way Suite 100
Bellevue WA 98004-1439

Phone Number: 206 827 9574
Fax Number: 206 827 2408

Sample ID	Date Sampled	Time Sampled	Matrix	Number of Containers	Halogenated Volatiles 8240	Volatile Aromatics 602/8020	Phenols 625/8270	Pesticides/ PCB'S 608/8080	PAH's 610/8310	Chlorinated Herbicides 8150	Volatile Organics 624/8240	BNA's 625/8270	DEQ TPH-G/WTPH-G w/BTEX	WTPH-418.1/DEQ TPH-418.1	WTPH-HCID/DEQ HCID	WTPH-D/DEQ TPH-D	WTPH-D Extended	Metals: (Total or Dissolved) List below	TCLP Metals / VOA / SemiVOA / Pest &Herb	TOC/TOX/TX	WTPH-G				
-1 B5	5/9/94		H_2O	4									/			/									
-2 B-5-33	5/9/94		Soil	2																	/				
-3 B-5-43	5/9/94			2									/												
-4 B-6-8	5/9/94	1357		2																	/				
-5 B-6-33	5/9/94	1426		2									/												
-6 B-6-53	5/9/94	1509		2																	/				
-7 B-7-33	5/10/94	0811		2									/												
-8 B-7-48	5/10/94	0839		2																	/				
-9 B-1-9.5	5/10/94	1505		2											/										
-10 B-1-25.5	5/10/94	1630	V	1											/										

P.O.# 9404.11
Bill to:

Turnaround Requested:
___24 hr (+100%)
___48 hr (+50%)
Date needed_____

Sample Receipt:
Condition_____
Cool? Yes No

Comments/Special Instructions:

Need in 5 business days

Relinquished By: Don Clabaugh — Date: 5/11/94 Time: 2:30
Company:
Received By: Jeanne Debert — Date: 5/11/94 Time: 2:30
Company: PNA

Relinquished By:_____ Date:_____ Time:_____
Company:_____
Received By:_____ Date:_____ Time:_____
Company:_____

By signing this form, you are agreeing to the terms and conditions listed on the back.

Distribution: White - Return to Originator; low - Lab; Pink - Retained by Originator